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Draft report of the International Law Commission on the work of its sixty-seventh session

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Chapter IV
Protection of the atmosphere

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General commentary

(1) The background to these draft guidelines, together with the underlying approach taken by the International Law Commission, is outlined in the preamble. It places the draft guidelines in the context of the pressing concern of the international community as a whole about the state of the atmosphere as a consequence of human activity, as well as the understanding reached by the Commission when it included the topic in its programme of work.

(2) The Commission recognises the importance of being fully engaged with the international community's present-day needs. It is acknowledged that both the human and natural environments can be adversely affected by certain changes in the condition of the atmosphere mainly caused by the introduction of harmful substances, causing transboundary pollution, ozone depletion, as well as changes in the atmospheric conditions leading to climate change. The Commission seeks, through the progressive development of international law and its codification, to provide guidelines that may assist the international community as it addresses critical questions in the field of transboundary and global protection of the atmosphere. In doing so, the Commission does not desire to interfere with relevant political negotiations, including those on long-range transboundary air pollution, ozone depletion and climate change, seek to "fill" gaps in treaty regimes nor to impose on current treaty regimes legal rules or legal principles not already contained therein. The draft guidelines are general and residuary in character.

Preamble

...

Acknowledging that the atmosphere is essential for sustaining life on Earth, human health and welfare, and aquatic and terrestrial ecosystems,

Bearing in mind that the transport and dispersion of polluting and degrading substances occur within the atmosphere,

Recognising therefore that the protection of the atmosphere from atmospheric pollution and atmospheric degradation is a pressing concern of the international community as a whole,

Recalling that these draft guidelines are not to interfere with relevant political negotiations, including those on climate change, ozone depletion, and long-range transboundary air pollution, and that they also neither seek to "fill" gaps in treaty regimes nor impose on current treaty regimes legal rules or legal principles not already contained therein,

...

Commentary

(1) In the past, the Commission has generally presented to the General Assembly an outcome of its work without a draft preamble, leaving its elaboration to States. However, there have also been precedents during which the Commission has prepared such preambles. This was the case, for instance, with respect to the two draft conventions on the elimination of future statelessness (1954)[1] and on the reduction of the future statelessness (1954);[2] the model rules on arbitral procedures (1958);[3] the

[1] *Yearbook ... 1954*, vol. II, doc. A/2693, para. 25.
[2] *Ibid.*

draft articles on the nationality of natural persons in relation to the succession of States (1999);[4] the draft articles on prevention of transboundary harm from hazardous activities (2001);[5] the guiding principles applicable to unilateral declarations of States capable of creating legal obligations (2006);[6] the draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities (2006);[7] and the draft articles on the law of transboundary aquifers (2008).[8]

(2) On such previous occasions, the preambles have been prepared once the Commission has concluded work on the particular topic. In the present case, the Commission, at its 3249th meeting, on 12 May 2015, decided to refer draft guidelines 1, 2, 3 and 5, as contained in the Special Rapporteur's second report to the Drafting Committee, with the understanding that draft guideline 3, on the common concern of humankind, be considered in the context of a possible preamble. Accordingly, a preamble was prepared reflecting the current stage of consideration, it being understood that there may be additional preambular paragraphs as the work progresses.

(3) The preamble seeks to provide a contextual framework for the draft guidelines. The first preambular paragraph is overarching in acknowledging the essential importance of the atmosphere for sustaining life on Earth, human health and welfare, and maintaining the integrity of aquatic and terrestrial ecosystems. The atmosphere is the Earth's largest single natural resource. It is listed as such — along with mineral, energy and water resources — by the United Nations Committee on Natural Resources,[9] as well as in the 1972 Stockholm Declaration on the Human Environment[10] and in the 1982 World Charter for Nature.[11] The atmosphere provides renewable "flow resources" essential for human, plant and animal survival on the planet. In addition to contributing basic economic production supplies (*e.g.*, oxygen and precipitation), as well as waste absorption services (*e.g.*, as a sink resource or dilution medium for combustion exhausts), it serves as a medium for transportation and communication ("spatial-extension resource").[12] The atmosphere was long

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[3] *Ibid.*, *1958*, vol. II, doc. A/3859, para. 22. The preamble reflected fundamental rules for undertaking to arbitrate.

[4] *Yearbook ..., 1999*, vol. II, Part Two, para. 47.Text also reproduced in General Assembly res. 55/153, annex, of 12 December 2000.

[5] *Yearbook ..., 2001*, vol. II, Part Two, para. 97. Text also reproduced in General Assembly res. 62/68, annex, of 6 December 2007.

[6] *Yearbook ... 2006*, vol. II, Part Two, para. 176. The text of the guiding principles is presented as an outcome by the Commission. Accordingly, preamble is by the Commission.

[7] *Yearbook ... 2006*, vol. II, Part Two, para. 66. Text also reproduced in General Assembly res. 61/36, annex, of 6 December 2006.

[8] See *Official Records of the General Assembly, Sixty-third Session, Supplement No. 10 (A/63/10)*, paras. 53 and 54.

[9] The inclusion of "atmospheric resources" among "other natural resources" by the former United Nations Committee on Natural Resources was first mentioned in the Committee's report on its first session (New York, 10 March 1971), section 4 ("other natural resources"), para. 94 (d). The work of the Committee (later United Nations Committee on Energy and Natural Resources for Development) was subsequently transferred to the Commission on Sustainable Development.

[10] "The natural resources of the earth including the air ... must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate." Declaration of the United Nations Conference on the Human Environment, UN Doc. A/CONF.48/14/Rev.1, 16 June 1972, Principle 2.

[11] "... atmospheric resources that are utilized by man, shall be managed to achieve and maintain optimum sustainable productivity, ..." World Charter for Nature, GA Res 37/7 of 28 October 1982, General Principles, para. 4.

[12] See the terminology coined by Siegfried von Ciriacy-Wantrup, *Resource Conservation: Economics and Policies*, 3rd edn (University of California Press,. 1968), pp. 40–42, and Myers

considered to be unlimited, non-exclusive, and neutral, since it was assumed that everyone could benefit from it without depriving others. That assumption is no longer valid.[13] It must be borne in mind that the atmosphere is a limited resource with limited assimilation capacity.

(4) The second preambular paragraph addresses the functional aspect of the atmosphere as a medium of transport and dispersion of polluting and degrading substances that occur within the atmosphere. While this could be part of the definition of the atmosphere, addressed in draft guideline 1 (a), which is confined to the physical aspects, the Commission considered it appropriate to refer to this functional aspect in the preamble. Trans-continental transport of polluting and degrading substances is recognized as one of the major problems of the present-day atmospheric environment,[14] with the Arctic region being identified as one of the most seriously affected areas by the worldwide spread of deleterious pollutants.[15]

(5) The third preambular paragraph pronounces, bearing in mind the aforementioned importance of the problems relating to the atmosphere, that the protection of the atmosphere from atmospheric pollution and atmospheric degradation is a "pressing concern of the international community as a whole." While the relevant treaty practice and literature demonstrate certain support for the concept of "common concern of humankind,"[16] the Commission decided not to adopt this language for the

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S. McDougal, Harold D. Lasswell & Ivan A. Vlasic, *Law and Public Order in Space*, (Yale University Press, 1963), at 777–779.

[13] The WTO Panel and Appellate Body recognized in the *Gasoline* case of 1996 that clean air was a "natural resource" that could be "depleted." *United States–Standards for Reformulated and Conventional Gasoline* (1996), Report of the Appellate Body: WT/DS2/AB/R (1996).

[14] See, J. S. Fuglesvedt, K. P. Shine, T. Berntsen, J. Cook, D. S. Lee, A. Stenke, R. B. Skeie, G. J. M Velders, I.A. Waitz, "Transport impacts on atmosphere and climate: metrics," *Atmospheric Environment*, vol. 44:37 (2010), pp. 4648–4677; I. Z. Shen, J. Liu, L. W. Horowitz, D.K. Henze, S. Fan, Levy II H., D.L. Mauzerall, J.-T.Lin and S. Tao, "Analysis of Trans-Pacific Transport of Black Carbon during HIPPO-3: Implications for Black Carbon Aging," *Atmospheric Chemistry and Physics*, vol.14 (2014), pp. 6315–6327 ; D. J. Wuebbles, H. Lei and J.-T Lin, "Inter-continental transport of aerosols and photochemical oxidants from Asia and its consequences," *Environmental Pollution*, vol. 150 (2007), pp. 65–84; J.-T Lin, X.-Z Liang and D. J. Wuebbles, "Effects of inter-continental transport on surface ozone over the United States: Present and future assessment with a global model," *Geophysical Research Letters*, vol. 35 (2008), L02805.

[15] See the 2001 Stockholm Convention on Persistent Organic Pollutants, United Nations, *Treaty Series*, vol. 2256, p. 119, (noting in the preamble that "persistent organic pollutants, ... are transported through air ... across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems"). The 2012 amendment of the Gothenburg Protocol to the 1979 Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-level Ozone, United Nations, *Treaty Series*, vol. 2319, p.81, reads in the third preambular para. that "Concerned ... that emitted [chemical substances] are transported in the atmosphere over long distance and may have adverse transboundary effects." The 2013 Minamata Convention on Mercury (adopted on 10 October 2013 at Kumamoto (Japan) on the occasion of the Conference of Plenipotentiaries on the Minamata Convention on Mercury held from 7 to 11 October 2013, text available at: https://treaties.un.org/doc/Treaties/2013/10/20131010%2011-16%20AM/CTC-XXVII-17.pdf), recognizes mercury as "a chemical of global concern owing to its long-range atmospheric transport" (first preambular para.). Several of these pollution threats to the Arctic environment have been identified, such as persistent organic pollutants (POPs) and mercury, which originate mainly from sources outside the region. These pollutants end up in the Arctic from southern industrial regions of Europe and other continents via prevailing northerly winds and ocean circulation. See Timo Koivurova, Paula Kankaanpää and Adam Stepien, "Innovative Environmental Protection: Lessons from the Arctic," *Journal of Environmental Law*, vol. 27, (2015), pp. 1–27, at p. 13. http://jel.oxfordjournals.org/content/early/015/02/13/jel.equ037.full.pdf?keytype=ref&ijkey=BjgzEgqY2lZXodu.

[16] Para. 1 of the preamble to the 1992 United Nations Framework Convention on Climate

characterization of the problem, as the legal consequences of the concept of common concern may not be as clear as they should be at the present stage of development of international law relating to the atmosphere. It was considered appropriate to express the concern of the international community more as a matter of factual designation, and not so much as a normative statement, of the gravity of the atmospheric problems. In this context, therefore, the expression "a pressing concern of the international community as a whole" has been employed. This is an expression that the Commission has frequently employed as one of the criteria for the selection of new topics for inclusion in its long term programme of work.[17]

(6) The fourth preambular paragraph is the reproduction of the 2013 understanding of the Commission on the inclusion of the topic in its programme of work at its sixty-fifth session in 2013. It was agreed that the terminology and location of this paragraph would be revisited at a later stage in the Commission's work on this topic.[18]

(7) Some other preambular paragraphs may be added, and the order of paragraphs may be coordinated, at a later stage.

Draft guideline 1
Use of terms

For the purposes of the present draft guidelines,

Change (UNFCCC), United Nations, *Treaty Series* , vol. 1771, p. 107, acknowledges that "change in the Earth's climate and its adverse effects are a common concern of humankind." Likewise, the preamble to the 1992 Convention on Biological Diversity, United Nations, *Treaty Series* , vol. 1760, p. 79, shows parties to be "[c]onscious ... of the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere," (para. 2) and affirms that "the conservation of biological diversity is a common concern of humankind" (para. 3). The 1994 Convention to Combat Desertification in Those Countries Experiencing Drought and/or Desertification, Particularly in Africa, United Nations, *Treaty Series* , vol. 1954, p. 3, adopted phrases similar to common concern in its preamble, including "the centre of concerns," "the urgent concern of the international community" and "problems of global dimension" for combatting desertification and drought. Other instruments such as the Minamata Convention on Mercury, the Stockholm Convention on Persistent Organic Pollutants and the Gothenburg Protocol to the 1979 LRTAP Convention employ similar concepts to the common concern. See, Alan E. Boyle, "International Law and the Protection of the Global Atmosphere: Concepts, Categories and Principles," Robin Churchill and David Freestone, eds., *International Law and Global Climate Change*, (Leiden: Kluwer Academic Publishing, 1991), pp. 11–12; Duncan French, "Common Concern, Common Heritage and Other Global(-ising) Concepts: Rhetorical Devices, Legal Principles or a Fundamental Challenge?," p. 13; Alexander Kiss, "The Common Concern of Mankind," *Environmental Policy and Law*, vol. 27, (1997), p. 246; A.A. Cançado-Trindade and D.J. Attard, "The Implication of the "Common Concern of Mankind" Concept on Global Environmental Issues", in Toru Iwama, ed., *Policies and Laws on Global Warming: International and Comparative Analysis* (Tokyo: Environmental Research Center, 1991), pp. 7–13; Jutta Brunnée, "Common Areas, Common Heritage, and Common Concern," *The Oxford Handbook of International Environmental Law*, Daniel Bodansky, Jutta Brunnee and Helen Hey, eds.,(Oxford: Oxford University Press, 2007), pp. 565–566. See also Charlotte Kreuter-Kirchhoff, "Atmosphere, International Protection", *Max Planck Encyclopedia of Public International Law*, vol. I, Rüdiger Wolfrum, ed., (Oxford: Oxford University Press, 2012), pp. 737–744 (the atmosphere as a "common concern of mankind").

[17] *Yearbook ... 1997*, vol. II, Part II, para. 238; *ibid., 1998*, vol. II, Part II, para. 553. See also *Official Records of the General Assembly, Sixty-ninth Session, Supplement No. 10* (A/69/10), para. 269. The Commission has agreed that it should not restrict itself to traditional topics, but could also consider those that reflect new developments in international law and pressing concerns of the international community as a whole.

[18] See also *Official Records of the General Assembly, Sixty-eighth Session, Supplement No. 10* (A/68/10), para. 168.

(a) "Atmosphere" means the envelope of gases surrounding the Earth;

(b) "Atmospheric pollution" means the introduction or release by humans, directly or indirectly, into the atmosphere of substances contributing to deleterious effects extending beyond the State of origin, of such a nature as to endanger human life and health and the Earth's natural environment;

(c) "Atmospheric degradation" means the alteration by humans, directly or indirectly, of atmospheric conditions having significant deleterious effects of such a nature as to endanger human life and health and the Earth's natural environment.

Commentary

(1) The Commission has considered it desirable, as a matter of practical necessity, to provide a draft guideline on the "Use of terms" in order to have a common understanding of what is to be covered by the present draft guidelines. The terms used are provided only "for the purposes of the present draft guidelines," and are not intended in any way to affect any existing or future definitions of any such terms in international law.

(2) No definition has been given to the term "atmosphere" in the relevant international instruments. The Commission, however, has considered it necessary to provide a working definition for the present draft guidelines. It has also considered that the definition presented should reasonably correspond to and reflect the characteristics of the atmosphere as identified in the scientific findings. Such a definition appears in paragraph (a), which is inspired by the definition given by the Intergovernmental Panel on Climate Change (IPCC).[19]

(3) To summarize the authoritative sources, the atmosphere exists in what is called the atmospheric shell.[20] It extends upwards from the Earth's surface, which is the bottom boundary of the atmosphere. The average composition of the atmosphere up to an altitude of 25 kilometres is as follows: Nitrogen (78.08%), oxygen (20.95%),together with trace gases, such as argon (0.93%), helium and radiatively active greenhouse gases, such as carbon dioxide (0.035%) and ozone, as well as greenhouse water vapour in highly variable amounts.[21] The atmosphere also contains clouds and aerosols.[22] The atmosphere is divided vertically into four spheres on the basis of temperature characteristics. From the lower to upper layers, these spheres are: troposphere, stratosphere, mesosphere and thermosphere. Approximately 80% of air mass exists in the troposphere and 20% in the stratosphere. The thin, white, hazy belt (with a thickness of less than 1% of the radius of the globe) that one sees when looking at the earth from a distance is the atmosphere. Scientifically these spheres are grouped together as the "*lower atmosphere*," which extends to an average altitude of 50 kilometres, and can be distinguished from the "*upper atmosphere*."[23] The

[19] 5th Assessment Report, Working Group III, Annex I. IPCC, Climate Change 2014, available at: http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ ipcc_wg3_ar5_annex-i.pdf.

[20] The American Meteorology Society defines the "atmospheric shell" (also called atmospheric layer or atmospheric region) as "any one of a number of strata or 'layers' of the earth's atmosphere" (http://amsglossary.allenpress.com/glossary/search?id=atmospheric-shell1).

[21] Physically, water vapour, which accounts for roughly 0.25 per cent of the mass of the atmosphere, is a highly variable constituent. In atmospheric science, "because of the large variability of water vapor concentrations in air, it is customary to list the percentages of the various constituents in relation to dry air". Ozone concentrations are also highly variable. Over 0.1 ppmv (parts per million by volume) of ozone concentration in the atmosphere is considered hazardous to human beings. See John M. Wallace and Peter V. Hobbs, *Atmospheric Science: An Introductory Survey*, 2nd ed. (Boston, Elsevier Academic Press, 2006), p. 8.

[22] *Ibid.*

[23] The American Meteorological Society defines the "lower atmosphere" as "generally and quite

temperature of the atmosphere changes with altitude. In the troposphere (up to the tropopause, at a height of about 12 kilometres), the temperature decreases as altitude increases because of the absorption and radiation of solar energy by the surface of the planet.[24] In contrast, in the stratosphere (up to the stratopause, at a height of nearly 50 kilometres), temperature gradually increases with height[25] because of the absorption of ultraviolet radiation by ozone. In the mesosphere (up to the mesopause, at a height of above 80 kilometres), temperatures again decrease with altitude. In the thermosphere, temperatures once more rise rapidly because of X-ray and ultraviolet radiation from the sun. The atmosphere extends above the mesopause and "has no well-defined upper limit".[26]

(4) The definition of the atmosphere as the envelope of gases surrounding the Earth represents a "physical" description of the atmosphere. There is also "functional" aspect, which involves the large-scale movement of air. The atmospheric movement has a dynamic and fluctuating feature. The air moves and circulates around the earth in a complicated formation called "atmospheric circulation".

(5) It is particularly important to recognize the function of the atmosphere as a medium within which there is constant movement as it is within that context that the "transport and dispersion" of polluting and degrading substances occurs. Indeed, the transcontinental transport of polluting substances is one of the major problems to the atmospheric environment, with the Arctic as one depository of deleterious pollutants, becoming the region most seriously affected by their worldwide spread. In addition to transboundary pollution, other concerns relate to the depletion of the ozone layer and to climate change. The Commission has decided, as noted earlier in the commentary to the preamble, to refer to this functional aspect of the atmosphere in the second paragraph of the preamble.[27]

(6) Paragraph (b) addresses transboundary air pollution, whereas paragraph (c) refers to global atmospheric problems. By stating "by humans," both paragraphs (b) and (c) make it clear that the draft guidelines address "anthropogenic" atmospheric pollution and atmospheric degradation. The Commission is aware that natural and anthropogenic substances and processes that alter the Earth's energy budget are drivers of climate change.[28] It is also aware that transboundary pollution is caused by other than anthropogenic substances and processes. At the same time, the science is also clear on the human influence on the climate system,[29] as well as on pollution. Accordingly, without losing sight of the linkages, the focus on human activity, whether directly or indirectly, is a deliberate one as the present guidelines seek to

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loosely, that part of the atmosphere in which most weather phenomena occur (i.e., the troposphere and lower stratosphere); hence used in contrast to the common meaning for the upper atmosphere", (http://amsglossary.allenpress.com/glossary/search?p=1&query=lower+atmosphere&submit=Search). The "upper atmosphere" is defined as residual, that is, "the general term applied to the atmosphere above the troposphere" (http://amsglossary.allenpress.com/glossary/search?p=1&query=upper+atmosphere&submit=Search).

[24] The thickness of the troposphere is not the same everywhere; it depends on the latitude and the season. The top of the troposphere lies at an altitude of about 17 km at the equator, although it is lower at the poles. On average, the height of the outer boundary of the troposphere is about 12 km. See Edward J. Tarbuck, Frederick K. Lutgens and Dennis Tasa, *Earth Science*, 13th ed. (Pearson, 2011), p. 466.

[25] Strictly, the temperature of the stratosphere remains constant to a height of about 20–35 km and then begins a gradual increase.

[26] See Tarbuck, Lutgens and Tasa, *Earth Science*, p. 467.

[27] See para. (3) of the second preambular paragraph.

[28] IPCC, *Climate Change 2013: The Physical science basis: Summary for policy makers*, available at: http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SummaryVolume_FINAL.pdf.

[29] *Ibid.*

address interventions that may be taken by the international community as a whole to protect the atmosphere.

(7) The term "atmospheric pollution" (or, air pollution) is sometimes used broadly to include global deterioration of atmospheric conditions such as ozone depletion and climate change,[30] but the term is used in the present draft guidelines in a narrow sense, in line with existing treaty practice. It thus excludes the global issues from the definition of atmospheric pollution.

(8) In defining "atmospheric pollution", paragraph (b), uses the language that is essentially based on article 1 (a) of the 1979 Convention on Long-Range Transboundary Air Pollution (LRTAP),[31] which provides that:

> "[a]ir pollution" means "the introduction by man, directly or indirectly, of substances or energy into the air resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems and material property and impair or interfere with amenities and other legitimate uses of the environment, and 'air pollutants' shall be construed accordingly."

This definition is widely used in the relevant conventions and literature. It may also be noted that article 1 (4) of the United Nations Convention on the Law of the Sea (UNCLOS)[32] defines the term "pollution" as meaning "the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, ..."[33] The deleterious effects arising from an introduction or release have to be of such a nature as to endanger human life and health and the Earth's natural environment.

(9) While article 1 (a) of the LRTAP Convention and the article 1, paragraph 1 (4) of the UNCLOS provide for "introduction of energy" (as well as substances) into the atmosphere as part of the "pollution," the Commission has decided not to include that term in the text of paragraph (b) of the draft guideline. It is the understanding of the Commission that the word "substances" include "energy." "Energy" is understood to

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[30] For instance, art. 1 (1) of the Cairo resolution (1987) of the Institute of International Law (Institut de droit international) on "Transboundary Air Pollution" provides that "[f]or the purpose of this Resolution, 'pollution' means any physical, chemical or biological *alteration in the composition* or quality of the atmosphere which results directly or indirectly from human action or omission and produces injurious or deleterious effects in the environment of other States or of areas beyond the limits of national jurisdiction." (emphasis added). Available at http://www.idi-iil.org/idiE/resolutionsE/1987_cairo_03_en.PDF.

[31] United Nations, *Treaty Series* , vol. 1302, p. 217. The formulation of LRTAP article 1(a) goes back to the definition of pollution by the Council of the Organisation for Economic Cooperation and Development (OECD) in its Recommendation C(74)224 on "Principles concerning Transfrontier Pollution", of 14 November 1974 (*International Legal Materials*, vol. 14, p. 242), which reads as follows: "For the purpose of these principles, pollution means the introduction by man, directly or indirectly, of substances or energy into the environment resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems, and impair or interfere with amenities and other legitimate uses of the environment". See H. van Edig (ed.), *Legal Aspects of Transfrontier Pollution* (Paris: OECD, 1977), p. 13; see also Patricia Birnie, Alan Boyle, Catherine Redgwell, *International Law and the Environment* (Oxford: Oxford University Press, 2009), pp. 188–189; A. Kiss and D. Shelton, *International Environmental Law* (London: Graham & Trotman, 1991), p. 117 (definition of pollution: "also forms of energy such as noise, vibrations, heat, radiation are included").

[32] United Nations, *Treaty Series*, vol. 1833, p. 3.

[33] Art. 212 of the UNCLOS provides for an obligation to prevent airborne pollution of the sea, and to that extent, the definition of "pollution" in this Convention is relevant to atmospheric pollution.

include heat, light, noise and radioactivity introduced and released into the atmosphere through human activities.[34]

(10) The expression "effects extending beyond the State of origin" in paragraph (b) clarifies that the draft guidelines address the transboundary effects in the sense provided in article 1 (b) of the 1979 LRTAP Convention that "[l]ong-range transboundary air pollution" means "air pollution whose physical origin is situated wholly or in part within the area under the national jurisdiction of one State and which has adverse effects in the area under the jurisdiction of another State at such a distance that it is not generally possible to distinguish the contribution of individual emission sources or groups of sources."

(11) Since "atmospheric pollution" is defined narrowly in paragraph (b), it is necessary, for the purposes of the draft guidelines, to address issues other than atmospheric pollution. For this purpose, paragraph (c) provides the definition of "atmospheric degradation." This definition is intended to include problems of ozone depletion and climate change. It covers the alteration of atmospheric conditions caused by humans, whether directly or indirectly. These may be changes to the physical environment or biota or alternations to the composition of the global atmosphere. The 1985 Vienna Convention on the Protection of Ozone Layer[35] provides the definition of "adverse effects" in article 1 (2) as meaning "changes in the physical environment or biota, including changes in climate, which have significant deleterious effects on human health or on the composition, resilience and productivity of natural and managed ecosystems, or on materials useful to mankind." Article 1 (2)

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[34] With regard to heat, see WMO/IGAC Report: Impact of Megacities on Air Pollution and Climate, GAW Report No. 205, WMO, (September 2012); David Simon and Hayley Leck, "Urban Adaptation to Climate/Environmental Change: Governance, Policy and Planning", Special Issue, *Urban Climate*, vol. 7, (2014) pp 1–134; John A. Arnfield, "Two decades of urban climate research: a review of turbulence, exchanges of energy and water, and the urban heat island," *International Journal of Climatology*, vol. 23, pp.1–26; Lisa Gartland, *Heat Islands: Understanding and Mitigating Heat in Urban Areas*, (London: Earthscan, 2008); See in general, Brian Stone Jr., *The City and the Changing Climate: Climate Change in the Places We Live*, (Cambridge, MA: Cambridge University Press, 2012). Regarding light pollution, see Catherine Rich and Travis Longcore, eds., *Ecological Consequences of Artificial Night Lighting*, (Washington DC: Island Press, 2006); Pierantonio Cinzano and Fabio Falchi, "The propagation of light pollution in the atmosphere", *Monthly Notices of the Royal Astronomic Society*, vol. 427 (2012), pp. 3337–3357; Fereshteh Bashiri and Che Rosmani Che Hassan, "Light pollution and its effects on the environment", *International Journal of Fundamental Physical Sciences*, vol. 4 (2014), pp. 8–12. Regarding acoustic/noise pollution, see e.g. Annex 16 of the 1944 Convention on International Civil Aviation (United Nations, *Treaty Series*, vol. 15, p. 295), vol. I: *Aircraft Noise*, 5th edn. 2008; see P. Davies and J. Goh, "Air Transport and the Environment: Regulating Aircraft Noise", *Air and Space Law*, vol. 18 (1993), pp. 123–135. Concerning radioactive emissions, the Austrian Government had expressed the view, in a statement during the *travaux préparatoires* of the Convention in January 1979 (UN Doc. ECE/ENV/AC.9/CRP.5/Add.3), pp. 2–3, paragraph 31, suggesting that the scope of the Convention "should also include the study of possible negative effects resulting from the peaceful uses of nuclear energy on the environment of a State or States other than the State within which such activities are carried out"; in this sense, see also Dietrich Rauschning, "Legal Problems of Continuous and Instantaneous Long-Distance Air Pollution: Interim Report," *Report of the Sixty-Second Conference of the International Law Association* (Seoul, 1986), pp. 198–223, at 219; and IAEA, *Environmental Consequences of the Chernobyl Accident and their Remediation: Twenty Years of Experience, Report of the Chernobyl Forum* Expert Group 'Environment' (Radiological Assessment Report Series), IAEA, April 2006, STI/PUB/1239. See also United Nations Scientific Committee on the Effects of Atomic Radiation 2013 Report to the General Assembly, Scientific Annex A: Levels and effects of radiation exposure due to the nuclear accident after the 2011 great east-Japan earthquake and tsunami, 2014, UN Publication Sales No. E14.IX.1, http://www.unscear.org/docs/reports/2013/13-85418_Report_2013_Annex.A.pdf.

[35] United Nations, *Treaty Series* , vol. 1513, p. 293.

of the United Nations Framework Convention on Climate defines "climate change" as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods."

(12) The term "significant deleterious effects" is intended to qualify the range of human activities to be covered by the draft guidelines. The Commission has frequently employed the term "significant" in its previous work.[36] The Commission has stated that "... significant is something more than "detectable" but need not be at the level of "serious" or "substantial". The harm must lead to real detrimental effects [and]... such detrimental effects must be able to be measured by factual and objective standards. Moreover, the term "significant", while determined by factual and objective criteria, also involves a value determination that depends on the circumstances of a particular case and the period in which such determination is made. For instance, a particular deprivation at a particular time might not be considered "significant" because at that time scientific knowledge or human appreciation did not assign much value to the resource. The question of what constitutes "significant" is more of a factual assessment.[37]

(13) While with respect to "atmospheric pollution" the introduction or release of substances has to contribute to "deleterious" effects, in the case of "atmospheric degradation" alteration of atmospheric conditions "significant deleterious effects". As is evident from draft guideline 2, on the Scope of the guidelines, the present guidelines are concerned with the protection of the atmosphere from both atmospheric pollution and atmospheric degradation. Given the nature of the atmosphere, the difference between "deleterious effects" and "significant deleterious effects" may be of little practical significance. As noted in paragraph (11) above, "adverse effects" in the Vienna Convention on the Protection of Ozone Layer[38] refers to changes, which have significant deleterious effects. The word "deleterious" refers to something harmful, often in a subtle or unexpected way.

Draft guideline 2
Scope of the guidelines

(a) The present draft guidelines [contain guiding principles relating to] [deal with] the protection of the atmosphere from atmospheric pollution and atmospheric degradation.

(b) The present draft guidelines do not deal with, but are without prejudice to questions concerning the polluter-pays-principle, the precautionary principle, common but differentiated responsibilities, the liability of States and their nationals, and the transfer of funds and technologies to developing countries, including intellectual property rights.

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[36] See for example art.7 of the Convention on the Law of the Non-navigational Uses of International Watercourses (1997); draft art.1 of the draft articles on prevention of transboundary harm from hazardous activities (2001) (GA. Res.62/68, annex); draft principle 2 of the draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities (2006) (GA. Res. 61/36, annex); draft art. 6 of the draft articles on the law of transboundary aquifers (2008) (GA res. 63/124, annex).

[37] See, for example, the commentary to the draft articles on prevention of transboundary harm from hazardous activities, (Commentary to art. 2, paras.4 and.7). See also the commentary to the draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities (Commentary to draft principle 2, paras. 1 to 3).

[38] United Nations, *Treaty Series* , vol. 1513, p. 293.

(c) The present draft guidelines do not deal with specific substances, such as black carbon, tropospheric ozone, and other dual-impact substances, which are the subject of negotiations among states.

(d) Nothing in the present draft guidelines affects the status of airspace under international law, nor questions related to outer space, including its delimitation.

Commentary

(1) Draft guideline 2 sets out the scope of the draft guidelines in relation to the protection of the atmosphere. Paragraph 1 provides the scope in a positive manner, indicating what is dealt with by the guidelines, while paragraphs 2 and 3 are formulated in a negative way, specifying what is not covered by the present draft guidelines. Paragraph (d) contains a saving clause on airspace and outer space.

(2) Paragraph 1 defines the scope of the draft guidelines on the basis of the definitions contained in paragraphs (b) and (c) of draft guideline 1. It deals with questions of the protection of the atmosphere in two areas, transboundary atmospheric pollution and global atmospheric degradation. The draft guidelines are concerned only with anthropogenic causes and not with those of natural origins such as volcanic eruptions and meteorite collisions. The focus on transboundary pollution and global atmospheric degradation caused by human activity reflects the current realities, which are supported by the science.[39] The science indicates with 95 percent certainty that human activity is the dominant cause of observed warming since the mid-20th century. The IPCC notes that human influence on the climate system is clear. Such influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes.[40] The IPCC further notes that it is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together.[41] The guidelines will also not deal with domestic or local pollution. It may be noted however that whatever happens locally may have a bearing on the transboundary and global context in so far as the protection of the atmosphere is concerned. Moreover, natural occurrences have an impact on the overall resilience and adaptive capacity of the Earth's environment, necessitating the need to recognize the local, national and global dimensions of adaptation. Accordingly, any ameliorative human action, taken individually or collectively, has to take into account the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

(3) Sulphur dioxide and nitrogen oxides are the main sources of transboundary atmospheric pollution,[42] while climate change and depletion of the ozone layer are the two principal concerns leading to atmospheric degradation.[43] Certain ozone depleting substances also contribute to global warning.[44]

(4) Whether or not the draft guidelines "contain guiding principles relating to" or "deal with" the protection of the atmosphere from atmospheric pollution and

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[39] See generally, IPCC *Climate Change 2013: The Physical Science Basis", Summary for Policy makers*, available at: http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SummaryVolume_FINAL.pdf.

[40] *Ibid.*

[41] *Ibid.*

[42] Birnie, Boyle, Redgwell, , p. 342.

[43] *Ibid.*, p. 336.

[44] *Ibid.*

atmospheric degradation is a matter that will have to be given further consideration as the work progresses.

(5) Paragraphs 2 and 3, as well as the fourth preambular paragraph, reflect the 2013 Understanding of the Commission when the topic was included in the programme of work of the Commission at its sixty-fifth session in 2013.[45]

(6) Paragraph 4 is a saving clause that the draft guidelines do not affect the status of airspace under applicable international law. Complicated legal issues abound, which the Commission does not wish to prejudice. In the first place, the atmosphere and airspace are two entirely different concepts, which should be distinguished. Airspace is a static and spatial-based institution over which the State has "complete and exclusive sovereignty." For instance, article 1 of the Convention on International Civil Aviation,[46] provides that "... every State has complete and exclusive sovereignty over the 'airspace' above its territory". In turn, article 2 of the same Convention deems the territory of a State to be the land areas and territorial waters adjacent thereto under the sovereignty, suzerainty, protection or mandate of such State. The airspace beyond the boundaries of territorial waters is regarded as being outside the sovereignty of any State and is open for use by all States, like the high seas. On the other hand, the atmosphere, as an envelope of gases surrounding the Earth, is dynamic and fluctuating, with gases that constantly move without regard to territorial boundaries.[47] The atmosphere is invisible, intangible and non-separable, even though there may exist an overlap with territorial sovereignty.

(7) Moreover, while the atmosphere is spatially divided into spheres on the basis of temperature characteristics, there is no sharp scientific boundary between the atmosphere and outer space. Beyond 100 kilometres, traces of the atmosphere gradually merge with the emptiness of space.[48] The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies is silent on the definition of "outer space".[49] The matter has been under discussion within the context of the Legal Sub-Committee of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) since 1959, which has looked at both spatial and function approaches to the questions of delimitation.[50]

(8) Accordingly, the Commission elected not to affect the legal status of airspace nor address questions related to outer space. Moreover, the reference to outer space reflects of the 2013 Understanding of the Commission.

Draft guideline 5
International cooperation

(a) States have the obligation to cooperate, as appropriate, with each other and with relevant international organisations, for the protection of the atmosphere from atmospheric pollution and atmospheric degradation.

(b) States should cooperate in further enhancing scientific knowledge relating to the causes and impacts of atmospheric pollution and atmospheric

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[45] *Official Records of the General Assembly, Sixty-eighth Session, Supplement 10* (A/68/10), para. 168.

[46] United Nations, *Treaty Series*, vol. 15, p. 295.

[47] See generally Birnie, Boyle, Redgwell, chap. 6.

[48] Tarbuck, Lutgens and Tasa, pp. 465 and 466.

[49] United Nations, *Treaty Series*, vol. 610, No. 8843.

[50] See generally, Bhupendra Jasani (ed), *Peaceful and Non-Peaceful uses of Space: Problems of Definition for the Prevention of an Arms Race*, United Nations Institute for Disarmament Research, (New York, Philadelphia, Washington DC, London, Taylor and Francis, 1991), especially Chap. 2 and 3

degradation. Cooperation could include exchange of information and joint monitoring.

Commentary

(1) International cooperation is at the core of the whole set of draft guidelines on the protection of the atmosphere. The concept of international cooperation has undergone a significant change in international law.[51] Rather than being perceived only as the "arithmetic aggregate" of bilateral collaborative relations in the traditional "international society," the concept of international cooperation is also to a large extent built on the notion of common interests of the "international community as a whole."[52] The third paragraph of the preamble to the present draft guidelines recognises that the protection of the atmosphere from atmospheric pollution and degradation is "a pressing concern of the international community as a whole". In this context, draft guideline 5 provides the obligation of States to cooperate, as appropriate, and stresses the importance, in particular, of exchanging scientific information and conducting joint monitoring in the protection of the atmosphere. In concrete terms, such cooperation is with other States and with relevant international organisations. The phrase "as appropriate" denotes certain flexibility and latitude for States in carrying out the obligation to cooperate depending on the nature and subject matter required for cooperation. The forms in which such cooperation may occur may also vary depending on the situation and the exercise of a certain margin of appreciation of States. It may be at the bilateral, regional or multilateral levels. States may also individually take appropriate action.

(2) International cooperation is found in several multilateral instruments relevant to the protection of the environment. Both the Stockholm Declaration on the Human Environment and the Rio Declaration on Environment and Development, in principle 24 and principle 27, respectively, stress the importance of cooperation.[53]

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[51] W. Friedmann, *The Changing Structure of International Law* (London: Stevens & Sons, 1964), pp. 60–71; Charles Leben, "The Changing Structure of International Law Revisited by Way of Introduction", *European Journal of International Law*, vol. 3 (1997), pp. 399–408. See also, Jost Delbrück, "The International Obligation to Cooperate — An Empty Shell or a Hard Law Principle of International Law? — A Critical Look at a Much Debated Paradigm of Modern International Law", H. P. Hestermeyer, *et al.*, eds., *Coexistence, Cooperation and Solidarity* (Liber Amicorum Rüdiger Wolfrum), vol. 1 (Leiden: Martinus Njihoff, 2012), pp. 3–16.

[52] Naoya Okuwaki, "On Compliance with the Obligation to Cooperate: New Developments of 'International Law for Cooperation'", in Jun'ichi Eto, ed., *Aspects of International Law Studies* (Festschrift for Shinya Murase) (Tokyo: Shinzansha, 2015), pp. 5–46, pp. 16–17 (in Japanese).

[53] Principle 24 of the Stockholm Declaration states:

> International matters concerning the protection and improvement of the environment should be handled in a cooperative spirit by all countries, big or small, on an equal footing. Cooperation through multilateral or bilateral arrangements or other appropriate means is essential to effectively control, prevent, reduce and eliminate adverse environmental effects resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.

Report of the United Nations Conference on the Human Environment, United Nations Doc. A/CONF.48/14, at 2 and Corr.1 (1972).

Principle 24 of the Rio Declaration states:

> "States and people shall cooperate in good faith and in a spirit of partnership in the fulfilment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development."

Report of the United Nations Conference on the Human Environment, Stockholm, 5–16 June 1972 (United Nations publication, Sales No. E.73.II.A.14 and corrigendum), chap. I.

(3) Among some of the existing treaties, the Vienna Convention for the Protection of the Ozone Layer (1985) provides, in its preamble, that the Parties to this Convention are "[*a*]*ware* that measures to protect the ozone layer from modifications due to human activities require international co-operation and action." Furthermore, the Preamble of the United Nations Framework Convention on Climate Change (1992) acknowledges that "the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response ...," while reaffirming "the principle of sovereignty of States in international cooperation to address climate change."

(4) Article 8 of the Convention on the Law of the Non-navigational Uses of International Watercourses, on the general obligation to cooperate, provides that:

> "[W]atercourse States shall cooperate on the basis of sovereign equality, territorial integrity and mutual benefit in order to attain optimal utilization and adequate protection of an international watercourse."

(5) In its work, the Commission has also recognized the importance of the obligation to cooperate. The Articles on prevention of transboundary harm from hazardous activities (2001) provide in draft article 4, on cooperation, that:

> "States concerned shall cooperate in good faith and, as necessary, seek the assistance of one or more competent international organizations in preventing significant transboundary harm or at any event in minimizing the risk thereof."

Further, the Articles on the law of transboundary aquifers provide in draft article 7, General obligation to cooperate, that:

> "1. Aquifer States shall cooperate on the basis of sovereign equality, territorial integrity, sustainable development, mutual benefit and good faith in order to attain equitable and reasonable utilization and appropriate protection of their transboundary aquifers or aquifer systems.
>
> 2. For the purpose of paragraph 1, aquifer States should establish joint mechanisms of cooperation."

(6) Finally, the draft articles on the protection of persons in the event of disasters, provisionally adopted on first reading in 2014, provides, in draft article 8, a duty to cooperate.[54]

(7) Paragraph (b) of the draft guidelines refers to the forms of cooperation, in which enhancing scientific knowledge relating to the causes and impacts of atmospheric pollution and atmospheric degradation is considered crucial. Cooperation could take a variety of forms. Paragraph (b) also highlights the exchange of information and joint monitoring.

(8) The Vienna Convention for the Protection of the Ozone Layer provides, in its preamble, that international co-operation and action should be "based on relevant scientific and technical considerations," and in article 4 (1), on co-operation in the legal, scientific and technical fields, there is provision that:

> "The Parties shall facilitate and encourage the exchange of scientific, technical, socio-economic, commercial and legal information relevant to this Convention as further elaborated in annex II. Such information shall be supplied to bodies agreed upon by the Parties."

[54] The article provides that "[i]n accordance with the present draft articles, States shall, as appropriate, cooperate among themselves, and with the United Nations and other competent intergovernmental organizations, the International Federation of Red Cross and Red Crescent Societies and the International Committee of the Red Cross, and with relevant non-governmental organizations".

Annex II to the Convention gives a detailed set of items for information exchange. Article 4 (2) provides for cooperation in the technical fields, taking into account the needs of developing countries.

(9) Article 4 (1) United Nations Framework Convention on Climate Change, regarding commitments, provides that:

> "All Parties ... shall (e) Cooperate in preparing for adaptation to the impacts of climate change; ... (g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies; (h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies; (i) Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations; ..."

(10) It may also be noted that article 9 of the Convention on the Law of the Non-navigational Uses of International Watercourses has a detailed set of provisions on exchange of data and information. Moreover, the LRTAP Convention provides in article 4 that the Contracting Parties shall exchange information on and review their policies, scientific activities and technical measures aimed at combating, as far as possible, the discharge of air pollutants which may have adverse effects, thereby contributing to the reduction of air pollution including long-range transboundary air pollution." The Convention also has detailed provisions on cooperation in the fields of research and development, article 7; exchange of information, article 8; and implementation and further development of the cooperative programme for the monitoring and evaluation of the long-range transmission of air pollutants in Europe in article 9. Similarly, the Eastern Africa Regional Framework Agreement on Air Pollution (Nairobi Agreement, 2008)[55] and the West and Central Africa Regional Framework Agreement on Air Pollution (Abidjan Agreement, 2009)[56] have identical provisions on international cooperation. The parties agree to:

> "1.2 Consider the synergies and co-benefits of taking joint measures against the emission of air pollutants and greenhouse gases; 1.4 Promote the exchange of educational and research information on air quality management; 1.5 Promote regional cooperation to strengthen the regulatory institutions ..."

(11) The second sentence of draft article 17 (4) of the Articles on the law of transboundary aquifers provides that: "Cooperation may include coordination of international emergency actions and communications, making available emergency response personnel, emergency response equipment and supplies, scientific and technical expertise and humanitarian assistance." In turn, the draft articles on the protection of persons in the event of disaster, provides in draft article 9, that "[f]or the

[55] 11 countries — Burundi, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Tanzania, Uganda — agreed to this framework agreement, available at: http://www.unep.org/urban_environment/PDFs/EABAQ2008-AirPollutionAgreement.pdf.

[56] 21 countries — Côte d'Ivoire, Angola, Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Congo Brazzaville, Democratic Republic of Congo, Equatorial Guinea, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo — agreed to this agreement, available at: http://www.unep.org/urban_environment/PDFs/BAQ09_AgreementEn.Pdf.

purposes of the present draft articles, cooperation includes humanitarian assistance, coordination of international relief actions and communications, and making available relief personnel, equipment and goods, and scientific, medical and technical resources". Further, draft article 10 (Cooperation for risk reduction) provides that "[c]ooperation shall extend to the taking of measures intended to reduce the risk of disasters".

(12) In the context of protecting of the atmosphere, enhancing scientific knowledge relating to the causes and impacts of atmospheric pollution and atmospheric degradation is considered key by the Commission. In the *Pulp Mills* case, the International Court of Justice emphasized linkages attendant to the obligation to inform, cooperation between the parties and the obligation of prevention. It noted that, "it is by cooperating that the States concerned can jointly manage the risks of damage to the environment ... so as to prevent the damage in question".[57]

[57] *Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010*, p. 49, para. 77.